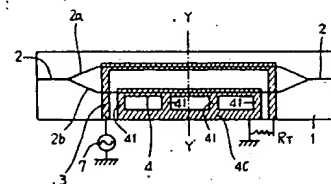


(54) OPTICAL MODULATOR

(11) 3-200924 (A) (43) 2.9.1991 (19) JP
 (21) Appl. No. 1-344075 (22) 28.12.1989
 (71) FUJITSU LTD (72) MINORU KIYONO(2)
 (51) Int. Cl⁵. G02F1/035

PURPOSE: To obtain a wide modulation width by forming an auxiliary grounding electrode separately outside a grounding electrode, and connecting both the electrodes electrically by plural grounding electrode bridges, and thus constituting the optical modulator.

CONSTITUTION: The grounding electrode 4 is formed to the same width as a signal electrode 3, so the distributions of an electric field applied to 1st, 2nd branch optical waveguides 2a and 2b are nearly equal and the electrodes can be driven by push-pull operation to enable low-voltage driving. Further, the wide auxiliary grounding electrode 40 is formed outside the grounding electrode 4 at a distance and the grounding electrode 4 and auxiliary grounding electrode 40 are connected electrically by the grounding electrode bridges 41, such the anxiety as the earthing is floated to cause induction is eliminated. Consequently, the wide modulation frequency band is obtained.



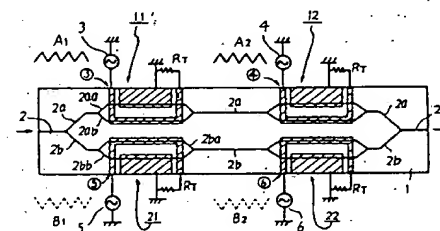
1: substrate, 2: optical waveguide

(54) MULTIPLEX LIGHT MODULATOR

(11) 3-200925 (A) (43) 2.9.1991 (19) JP
 (21) Appl. No. 1-344076 (22) 28.12.1989
 (71) FUJITSU LTD (72) MINORU KIYONO(1)
 (51) Int. Cl⁵. G02F1/035

PURPOSE: To eliminate a trouble to the band expansion of an external optical modulator by constituting this multiplex light modulator so that light output signals outgoing from an outgoing side optical waveguides are multiplex against the time base.

CONSTITUTION: Light modulators 11 and 12, 21 and 22 are connected in series with branching optical waveguides 2a and 2b which are connected in parallel and the slave optical modulators 12 and 22 are applied with electric signals for modulation which have the same waveform and are in phase with a traveling light wave point. Then light beams outgoing from trailing-stage light modulators 12 and 22 have steeper leading edges and trailing edges, and sharp pulse trains which have the same period, but the narrow in width are obtained. Optical modulators 11 and 12, and 21 and 22 belonging to different branching optical waveguides 2a and 2b are driven with out-of-phase electric signals for modulation and then pulse trains which have the same period with the pulse trains and have sharp peaks at positions differing with time are obtained. The both are multiplexed at a multiplexing point to obtain a light pulse signal which is multiplexed at a high bit rate. Consequently, the band of the optical modulator can be expanded.



1: substrate

(54) LIQUID CRYSTAL CONSTITUTING BODY

(11) 3-200926 (A) (43) 2.9.1991 (19) JP
 (21) Appl. No. 1-323997 (22) 15.12.1989 (33) JP (31) 89p.273855 (32) 23.10.1989
 (71) TEIJIN LTD (72) KENJI NAKATANI(1)
 (51) Int. Cl⁵. G02F1/1333

PURPOSE: To obtain the liquid crystal constituting body which can be easily produced and has excellent durability by controlling the impression of the voltage to electrode layers, thereby controlling the orientation of the liquid crystal molecules in the liquid crystal droplight dispersed in a resin.

CONSTITUTION: The transparent conductive electrode layers 20 are provided on transparent substrates 10 and after a liquid mixture composed of a polycarbonate urethane acrylate oligomer and a cyanobiphenyl system liquid crystal is applied at a uniform thickness on the transparent conductive electrode layers 20, the substrates are superposed on the liquid crystal layer 30 to form a laminate. This laminate is irradiated with UV rays to cure the polycarbonate urethane acrylate oligomer. While the liquid crystal film 30 cured by a method, such as irradiation with U rays has 2 to 30 μ m thickness, the thickness is selected by taking the opacity of the liquid crystal film in the state of not impressing the voltage to the transparent conductive electrode layers 20 and the transparency at the time of impressing the voltage into consideration. The liquid crystal constituting body obtd. in such a manner has the excellent durability and can be easily produced.

